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PATENT SPECIFICATION

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COMPLETE SPECIFICATION.

Improvements in or relating to Devices for Dispensing Materials of
Ribbon-Like or Filamentary Form.

I, EDGAR WILLIAM EDWARDS, a British Subject, of 37 Talbot Avenue, Kingswood, Bristol, in the County of Gloucester, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement :—

This invention relates to devices for dispensing materials of ribbon-like or filamentary form. It is an object of the invention to provide a simple device that will accommodate a roll or spool of material which can be drawn off the roll or spool according to requirements, continuously or intermittently, while at the same time the material is maintained in a slight state of tension, without the use of elaborate braking or other means.

According to the invention, a device for dispensing material of ribbon-like or filamentary form from a roll or spool comprises a checking surface inclined at approximately 45° to the vertical, lateral guides for the roll or spool located against the checking surface with its axis parallel to said checking surface, and a plurality of supporting rollers located with their axes parallel to said checking surface and arranged in a substantially straight line normal to said checking surface, the arrangement being such that when the material is subjected to less than a predetermined tension the roll or spool rests on the checking surface and at least one of the supporting rollers and resists rotation, but when the predetermined tension in the material is exceeded the roll or spool is lifted off the checking surface, is rotatably supported solely by the supporting rollers, and permits the material to be drawn off as required.

The lowermost supporting roller may be spaced from the checking surface by a distance greater than the diameter of an empty

roll or spool, and passages may be provided for the empty roll or spool to drop from the device.

One embodiment of the invention will be described with reference to the accompanying drawings, in which :

Figure 1 is a diagrammatic side elevation of a device with one side wall removed, showing a spool of ribbon at rest ; and

Figure 2 is a corresponding view showing the spool when the predetermined tension in the ribbon has been exceeded.

Referring to the drawings, the embodiment illustrated is for use in dispensing ribbon.

The ribbon 10 is mounted on a reel conveniently constituted by a cardboard tube 11 about one inch in diameter. The diameter of the roll 10 is 10 inches. The device has two parallel lateral guide walls 12 spaced apart by a distance slightly greater than the width of the ribbon 10 to be dispensed. These guide walls 12 are of approximately right-angled triangular shape, the hypotenuses 13 of the triangles being horizontal and the triangles themselves having their apices 14 pointing downwards. The shorter sides of the triangles are inclined at not less than 45°, and the two guide walls 12 are joined by another wall 15 termed the "checking surface." Near the other wall 16 which serves to space the triangular guide walls 12 there are four rollers 17, 18, 19, 20 rotatably mounted on spindles which extend between the guide walls 12. The spindle of the roller 17 is located on the median line of the triangular guide walls 12, at such a distance above the apices 14 as to leave a space, between the lowermost roller 17 and the adjacent part of the checking surface 15 as to give passage for the empty cardboard reel 11, which as stated is about one inch in diameter. The rollers 17, 18, 19, 20 are spaced from one another at distances of the order of an inch

or so, dependent on the diameter of the roll 10 to be dispensed. The rollers 18, 19, and 20 lie on a line parallel with the wall 16.

In use, the device may be mounted in any convenient way, and the roll 10 of ribbon is placed between the guide walls 12 so as to rest on the checking surface 15 and on the bottom roller 17 and the two adjacent rollers 18 and 19. In this position of the roll 10 the friction between its outside periphery and the checking surface 15 immobilizes the roll. The ribbon 10a is led tangentially from the roll 10 out of the top of the device to any desired destination.

When the predetermined tension on the ribbon 10a is exceeded, the roll 10 as a whole lifts away from the checking surface 15, as shown in Figure 2 and is maintained in a state of approximate equilibrium on the rollers 18 and 19, or 19 and 20, and so long as this predetermined tension is exceeded, the state of approximate equilibrium is maintained by the roll 10 of ribbon rotating about its own axis and being supported by two or more of the rollers, which themselves simultaneously rotate. Should the predetermined tension be considerably exceeded, the roll 10 will tend to climb from the rollers 18 and 19 to the rollers 19 and 20, but at the same time its speed of rotation will be increased, and, neglecting any extremely sudden and violent increases in the tension, it will continue to dispense the ribbon as required. As soon as the tension in the ribbon 10a is less than the predetermined tension the roll 10 slows down and drops back until it is again supported by the checking surface 15 as well as by the lowermost roller 17, and it then comes to rest and so remains until the predetermined tension in the ribbon 10a is again exceeded.

In this way, the roll 10 may be made to dispense its ribbon as required, until all the ribbon has been unrolled. As the diameter of the roll 10 decreases from the original 10 inches down to the one inch diameter of the cardboard reel 11, the behaviour of the roll remains the same, for since the lowermost roller 17 is on the median line of the triangu-

lar guide walls, the roll 10 falls back against the checking surface 15 whenever the tension in the ribbon 10a is less than the predetermined tension.

When all the ribbon has been dispensed the empty cardboard reel 11 falls through the aperture 21 at the bottom of the triangular guide walls 12 between the lowermost roller 17 and the checking surface 15, and a fresh roll 10 of ribbon is then inserted between the guide walls 12 for use as previously described.

What I claim is:—

1. A device for dispensing material of ribbon-like or filamentary form from a roll or spool, comprising a checking surface inclined at approximately 45° to the vertical, lateral guides for the roll or spool located against the checking surface with its axis parallel to said checking surface, and a plurality of supporting rollers located with their axes parallel to said checking surface and arranged in a substantially straight line normal to said checking surface, the arrangement being such that when the material is subjected to less than a predetermined tension the roll of spool rests on the checking surface and at least one of the supporting rollers and resists rotation, but when the predetermined tension in the material is exceeded the roll or spool is lifted off the checking surface, is rotatably supported solely by the supporting rollers, and permits the material to be drawn off as required.

2. A device as claimed in Claim 1, wherein the lowermost supporting roller is spaced from the checking surface by a distance greater than the diameter of an empty roll or spool, and passage is provided for the empty roll or spool, to drop from the device.

3. A device for dispensing material of ribbon-like or filamentary form from a roll or spool substantially as hereinbefore described with reference to the accompanying drawings.

A. M. & Wm. CLARK,
Chartered Patent Agents,
Quality House, 5-9 Quality Court,
Chancery Lane, London, W.C.2.

PROVISIONAL SPECIFICATION.

Improvements in or relating to Devices for Dispensing Materials of Ribbon-Like or Filamentary Form.

I, EDGAR WILLIAM EDWARDS, a British Subject, of 37 Talbot Avenue, Kingswood, Bristol, in the County of Gloucester, do hereby declare this invention to be described in the following statement:—

This invention relates to devices for dispensing materials of ribbon-like or filamentary form. It is an object of the invention to provide a simple device that will

accommodate a roll or spool of material which can be drawn off the roll or spool according to requirements, continuously or intermittently, while at the same time the material is maintained in a slight state of tension, without the use of elaborate braking or other means.

According to the invention, a device for dispensing material of ribbon-like or fila-

mentary form from a roll or spool comprises a checking surface inclined at approximately 45° to the vertical, lateral walls serving as guides for the roll or spool located against the checking surface with its axis parallel to said checking surface, and a plurality of supporting rollers located with their axes parallel to said checking surface and arranged in a substantially straight line normal to said checking surface, the arrangement being such that when the material is not subjected to a predetermined tension the roll or spool rests on the checking surface and at least one of the supporting rollers and resists rotation, but when the predetermined tension in the material is exceeded the roll or spool is lifted off the checking surface, is rotatably supported solely by the supporting rollers, and permits the material to be drawn off as required.

The lowermost supporting roller may be spaced from the checking surface by a distance greater than the diameter of an empty roll or spool, and passage may be provided for the empty roll or spool to drop from the device.

According to one embodiment of the invention for use in dispensing ribbon, the ribbon is mounted on a forme constituting the equivalent of a roll or spool and comprising conveniently a cardboard tube about one inch in diameter. The diameter of the roll is 10 inches. The device has two parallel lateral guide walls spaced apart by a distance slightly greater than the width of the ribbon to be dispensed. These guide walls are of approximately right angled triangular shape, the hypotenuses of the triangles being horizontal and the triangles themselves having their apices pointing downwards. Corresponding sides of the triangles are inclined at not less than 45°, and two of such sides are joined by another wall which may conveniently be employed to unite the two guide walls, this uniting wall being termed the "checking surface". Near the other lateral inclined margins of the triangular guide walls there are four rollers rotatably mounted on spindles which extend between the guide walls. The lowest of these spindles is located on the median line of the triangular guide walls, at such a distance above the apices as to leave a space on either side thereof, that is, between the lowermost roll and the adjacent checking surface, as to give passage for the empty cardboard forme, which as stated is about one inch in diameter. Also near those lateral inclined margins of the triangular guide walls remote from the checking surface are three further rollers, also rotatably mounted on spindles extending between the guide walls, the spindles being spaced from

one another at distances of the order of an inch or so (dependent on the diameter of the roll to be dispensed) and lying on a line parallel with the edge of the guide walls.

In use, the device may be mounted in any convenient way, and the roll of ribbon is placed between the guide walls so as to rest on the checking surface and on the bottom roller and one or more of the adjacent rollers. In this position of the roll the friction between its outside periphery and the checking surface immobilizes the roll. The ribbon is led tangentially from the roll out of the top of the device to any desired destination.

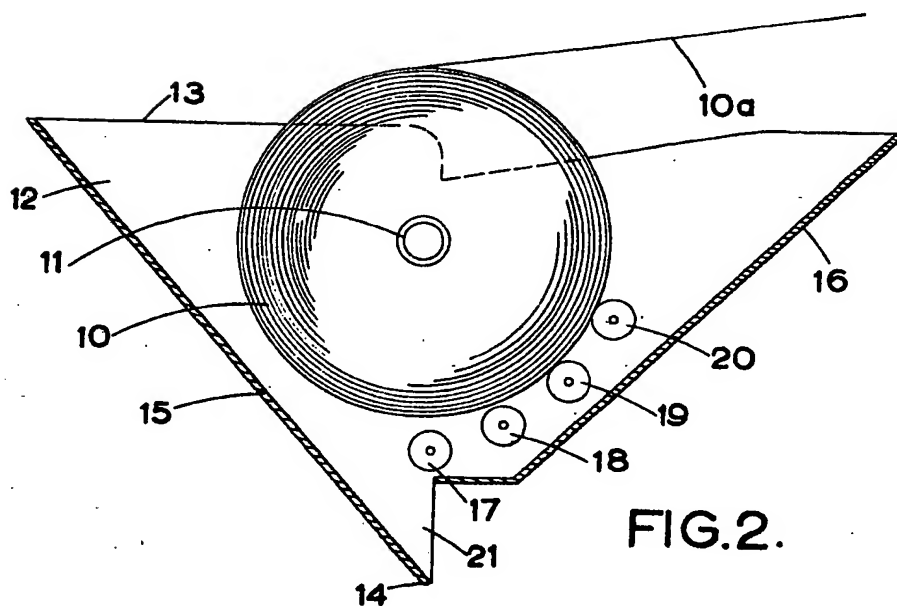
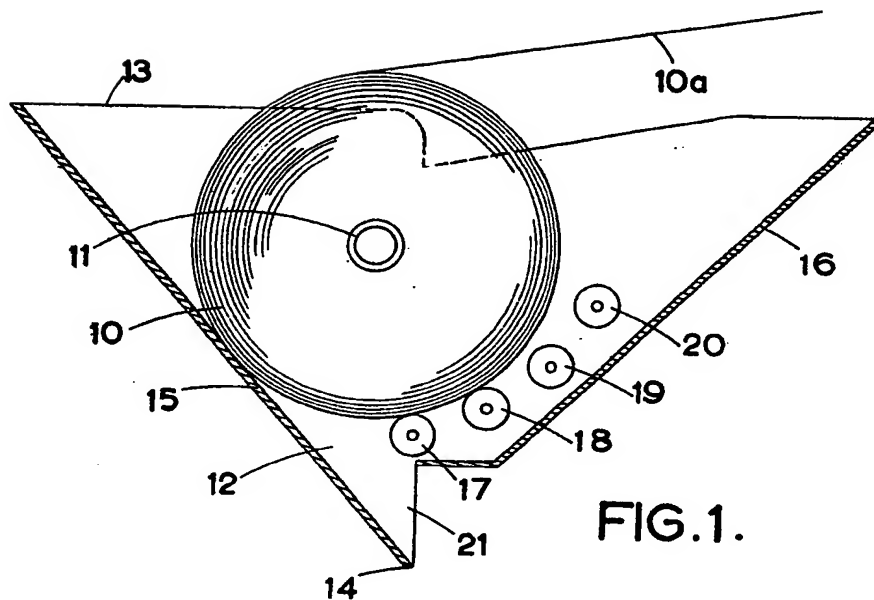
When the predetermined tension on the ribbon is exceeded, the roll as a whole lifts away from the checking surface and is maintained in a state of approximate equilibrium on the rollers themselves, and so long as this predetermined tension is exceeded, the state of approximate equilibrium is maintained by the roll of ribbon rotating about its own axis and being supported by two or more of the rollers, which themselves simultaneously rotate. Should the predetermined tension be considerably exceeded, the roll will tend to climb from the bottom or middle rollers towards the top roller, but at a same time its speed of rotation will be increased, and, neglecting any extremely sudden and violent increases in the tension, it will continue to dispense the ribbon as required. As soon as the tension in the ribbon is less than the predetermined tension the roll slows down and drops back until it is again supported by the checking surface as well as by the lowermost roller, and it then comes to rest and remains thus until the predetermined tension is again exceeded.

In this way, the roll may be made to dispense its ribbon as required, until all the ribbon has been unrolled. As the diameter of the roll decreases from the original 10 inches down to the one inch diameter of the cardboard formed, the behaviour of the roll remains the same, for since the lowermost roller is on the median line of the triangular guide walls, the roll falls back against the checking surface whenever the tension in the ribbon is less than the predetermined tension.

When all the ribbon has been dispensed the empty cardboard forme falls through the aperture at the bottom of the triangular guide walls between the lowermost roller and the checking surface, and a fresh roll of ribbon is then inserted between the guide walls for use as previously described.

A. M. & Wm. CLARK,
Chartered Patent Agents,
5-9 Quality Court, Chancery Lane,
London, W.C.2.

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